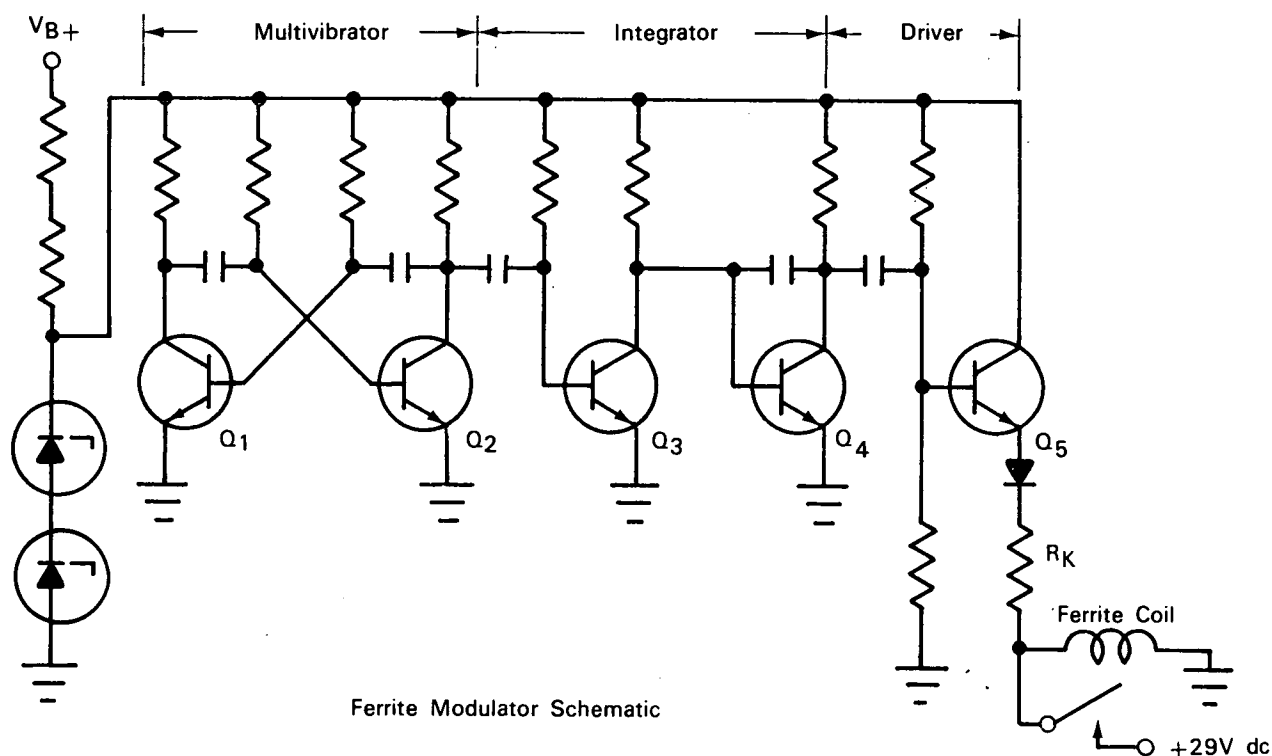


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Ferrite Attenuator Modulation Improves Antenna Performance



The problem:

Multiple antenna systems onboard aircraft create undesirable interference zones under certain conditions—equal signal strength and a 180° phase displacement. The interference zones reduce the signal strength at the ground receiving station during critical flight periods; i.e., takeoff and landing.

The solution:

Reduce the gain of the antenna element causing the interference by inserting a ferrite attenuator into the appropriate waveguide. Modulating the ferrite attenuator to change the antenna gain at the receive fre-

quency permits ground tracking until the antenna is no longer required, at which time the fixed attenuation quantity is inserted into the waveguide.

How it's done:

The modulator schematic shown in the figure is composed of three sections: (1) a multivibrator, (2) an integrator, and (3) a driver for the ferrite coil. The multivibrator is a free running circuit that establishes the frequency of the modulation wave. Q_3 is a switch in the Miller integrator and is controlled by the multivibrator output. The charging and discharging of the capacitor between the base and collector of Q_4 deter-

(continued overleaf)

mines the final output waveshape. The emitter follower, Q_5 , drives the ferrite coil. A blocking diode added to the emitter circuit prevents feedback from the 29 V dc applied to the ferrite coil. R_K inserted in the emitter of Q_5 determines the amount of attenuation required.

Notes:

1. With minor modification, the modulation technique can be applied to navigation and communication systems employing phased-array antenna elements.
2. Requests for further information may be directed to:
Technology Utilization Officer
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4800 Oak Grove Drive
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Patent status:

Inquires about obtaining rights for the commercial use of this invention may be made to:

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